→ NEWSLETTER JUNE 2025

ESA's NEO Coordination Centre

Current NEO statistics

The effect of shorter Northern nights is likely already visible in the discovery statistics, with less than 200 new NEOs discovered in May.

- Known NEOs: 38 469 asteroids and 123 comets
- NEOs in risk list*: 1791
- NEOs designated during last month: 162
- NEOs discovered since 1 January 2025: 1335

Focus on

In this newsletter, with the help of the table and figure in the next page, we are exploring a bit where current and past surveys discover new NEOs.

It is easy to understand that most asteroids should be found when they are closest to the Earth, just because the smaller distance makes them brighter and easier to spot. However, the plot shows that it is not always the case: while small objects are almost always found at their closest point, for distant objects that is not always the case. In the past, there have been large NEOs that were first spotted while crossing the Main Belt, despite having orbits that brought them much closer to the Earth at other times.

This can be explained by the complex interactions between an object's orbit and our observing capabilities on Earth. For example, it is possible that a certain object, on a given orbit, always has close approaches over the Southern hemisphere, where our survey coverage is more limited. It is also possible for an orbit to favour an approach in the sunward directions, where optical telescopes on the ground cannot see.

These biases show how important it is to diversify discovery facilities, in order to cover a larger discovery parameter space, and avoid biasing our discovery completeness against some orbits where large undiscovered asteroids may potentially reside.

Upcoming interesting close approaches

A moderately large asteroid will have a distant fly-by this month.

• (424482) 2008 DG5 is a large asteroid, between 300 and 700 metres, which will fly-by the Earth at 9 lunar distances in June, reaching magnitude 14.

Recent interesting close approaches

Three small asteroids came close to the Earth within 24 hours of each other.

• 2025 KF, 2025 KF2, and 2025 KS1 are three small asteroids that came within 0.4 lunar distances of the Earth on 21 and 22 May. The first and the last, both in the 10-20 metre range, became as bright as magnitude 14, while the middle one was tiny, just a couple of metres in size, and only reached magnitude 17.

News from the risk list

A new object entered the top-10 of the risk list, and one left it after a few months.

- 2025 JU is a new entry in our risk list, with a 1 in 30 000 chance of impacting the Earth in year 2074.
- 2025 FA22 is now out of our risk list due to new observations, but will become bright and easily observable in September, during an unusually close fly-by.

*The risk list of all known objects with a non-zero (although usually very low) impact probability can be found at https://neo.ssa.esa.int/risk-list

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In other news

- The annual Asteroid Day events will happen in Luxembourg on 27 and 28 June 2025, with many additional
 asteroid-themed events organised all over the world. You can read about them at https://asteroidday.org/.
- The next IAA Planetary Defense Conference has been announced: it will be held from 3-7 May 2027 at McGill. University in Montreal, Quebec, Canada.
- The Tianwen-2 mission by the China National Space Administration was launched on 28 May. It is planned to collect and bring back to Earth a sample of the near-Earth asteroid (469219) Kamo'oalewa.

Upcoming events

- Meteoroids 2025, 7-11 July 2025, Perth, Australia https://meteoroids2025.gfo.rocks
- Europlanet Science Congress (EPSC) 2025 (joint meeting with the 57th Annual Meeting of the AAS Division for Planetary Sciences), 7-12 September 2025, Helsinki, Finland https://www.epsc-dps2025.eu/

NEAs discovered at large distances

The table lists the 10 NEAs which were located at the farthest distance from the Earth at the time of discovery. They are all larger than about 1 km, and were mostly found in the first 15 years of dedicated NEO surveying.

Asteroid	Discovery Date	Distance to Earth at discovery in au	Visual magnitude at discovery	MOID in au	н
2010 HY22	2010-04-23	3.442	23.0	0.028	16.6
(661492) 2004 TX37	2004-09-17	2.853	21.4	0.218	15.7
2017 MK8	2017-06-23	2.772	22.5	0.173	16.8
(533671) 2014 LJ21	2013-06-15	2.756	21.4	0.027	15.9
(751530) 2015 DV315	2015-01-27	2.683	22.4	0.104	17.0
(278327) 2007 HA59	2007-04-24	2.594	20.8	0.282	15.4
(404108) 2012 SF51	2010-05-13	2.591	20.8	0.164	15.4
(96744) 1999 OW3	1999-07-18	2.589	20.0	0.363	14.9
2013 HP148	2013-04-17	2.568	23.0	0.092	17.9
(756958) 2021 NS5	2016-05-01	2.451	23.3	0.080	18.5



The plot presents the distance from the Earth of all known NEAs at the time of their discovery, as a function of their current MOID (Minumum Orbit Intersection Distance), i.e. the closest distance between the orbit of the asteroid and that of the Earth. The objects are coloured by absolute magnitude, a proxy for their size.

It shows that most small objects (blue dots) are found when very close to the Earth, and very close to the minimum distance they can reach. This is a direct consequence of their brightness, that falls within our discovery capabilities only for a short time in the ideal geometry conditions.

[Credit: ESA PDO]

Links for more information

Website: https://neo.ssa.esa.int Close approaches page: https://neo.ssa.esa.int/close-approaches Risk List: https://neo.ssa.esa.int/risk-list

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